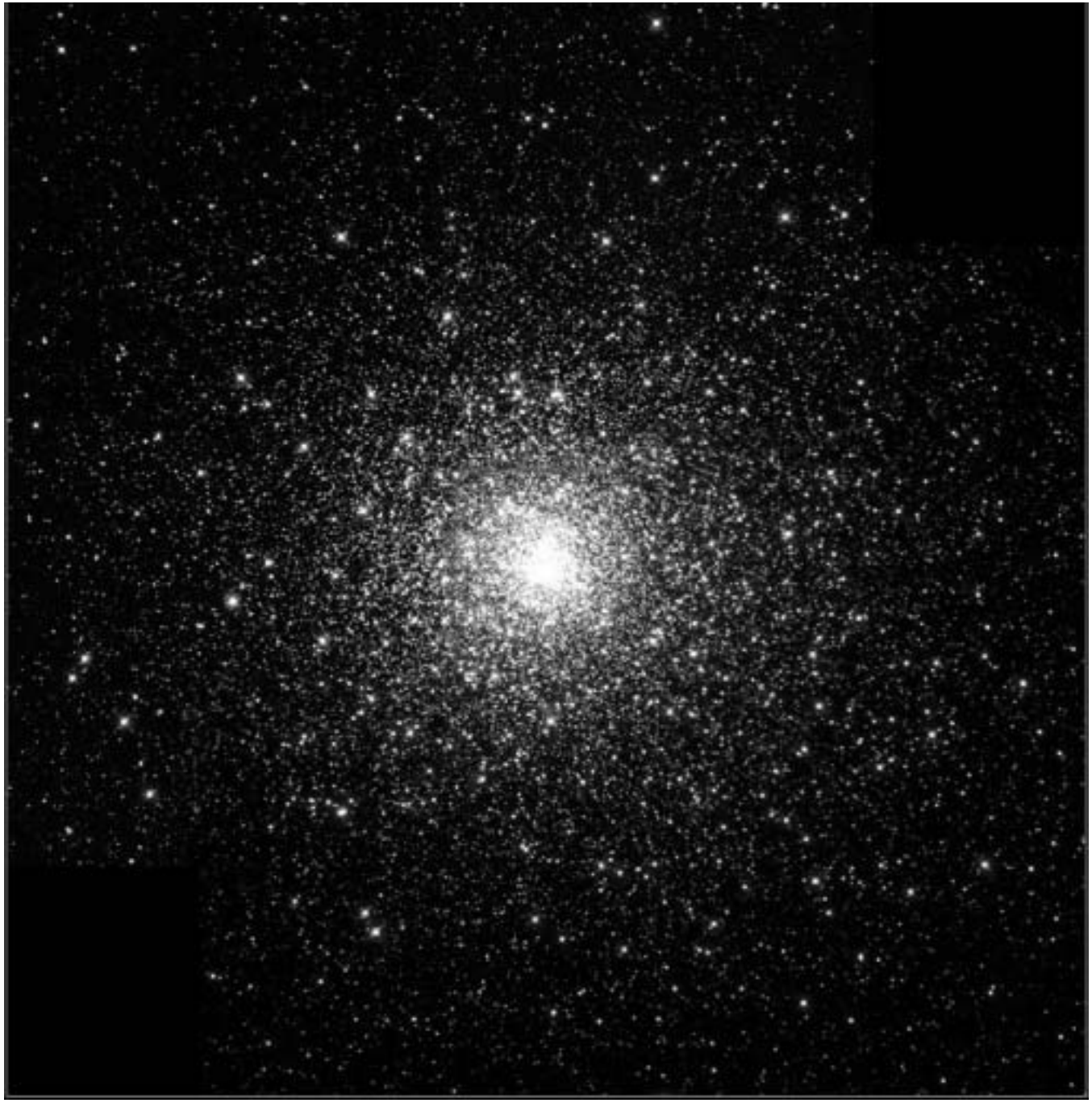
If it's called "CLEAR CREEK", then why aren't the answers *CLEAR* ?!!

Rhonda Brown
Galveston District
COE

WHITE DWARF STARS:

The oldest stars in the universe…..

12-13 billion years old.



Clear Creek – Brief Chronology

1962 – Initial Study Authorized by Flood Control Act of 1962

1968 – Project Authorized by Flood Control Act of 1968

1970 – National Environmental Policy Act (NEPA)

1972-86 – No new construction starts

1997 Jul – Second Outlet Channel completed

1997 Dec –Local Sponsor presented "Sponsor-Proposed Alternative" due to public opposition to Corps project

1999 Feb – COE determines GRR required due to change in scope

CLEAR CREEK PROJECT
STUDY TEAM AND SPONSORS

U.S. Army Corps of Engineers

P.O. Box 1229
Galveston, Texas 77553-1229
409.766.3051

LOCAL SPONSORS

Harris County Flood Control District
(Lead Sponsor)

Harris County
Flood Control District

9900 Northwest Freeway
Houston, Texas 77092
713.684.4040

Galveston County

123 Rosenberg
Galveston, Texas 77550

Brazoria Drainage District Number Four

4805 West Broadway
Pearland, Texas 77581

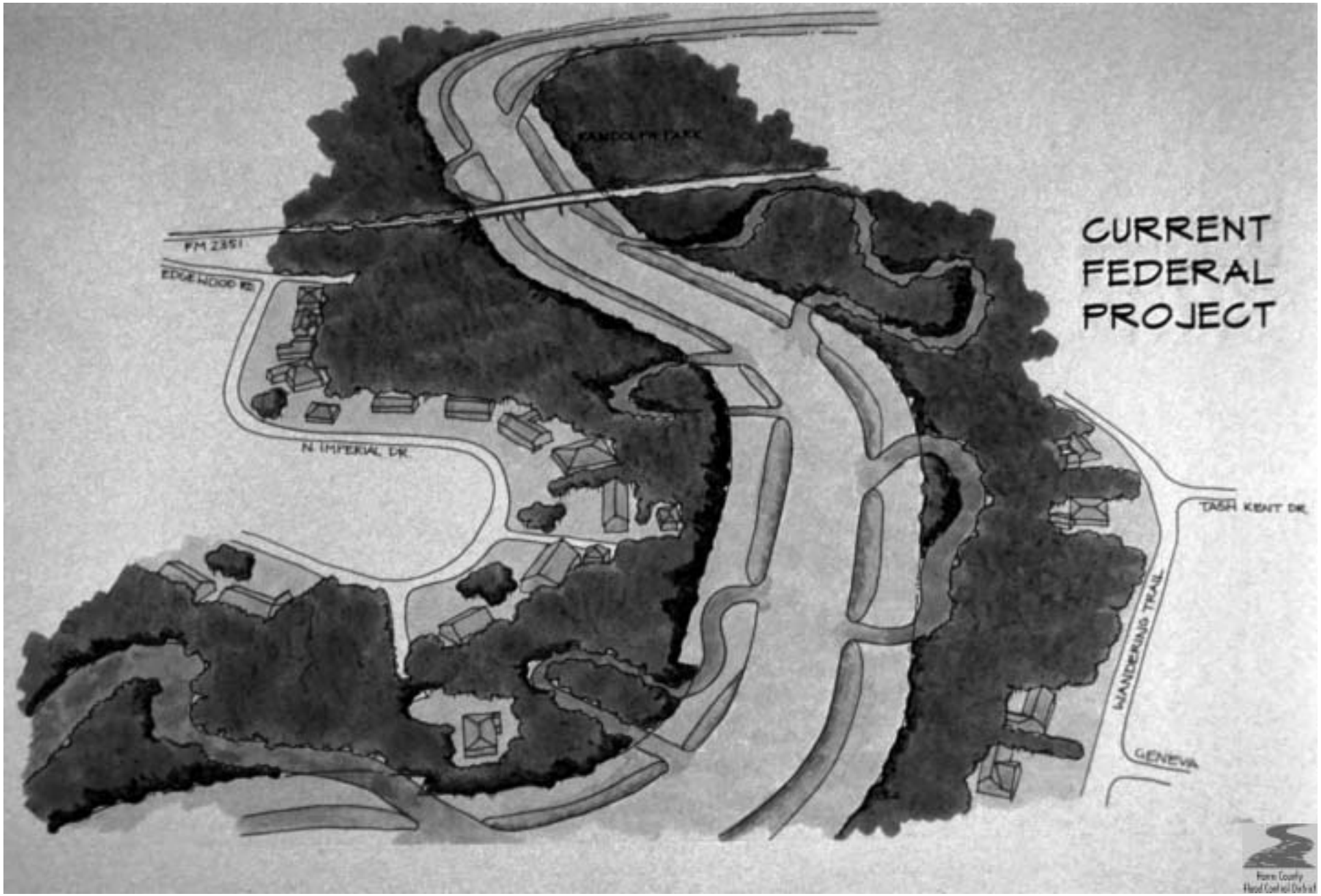

Tiaoa O.C.C.


1995

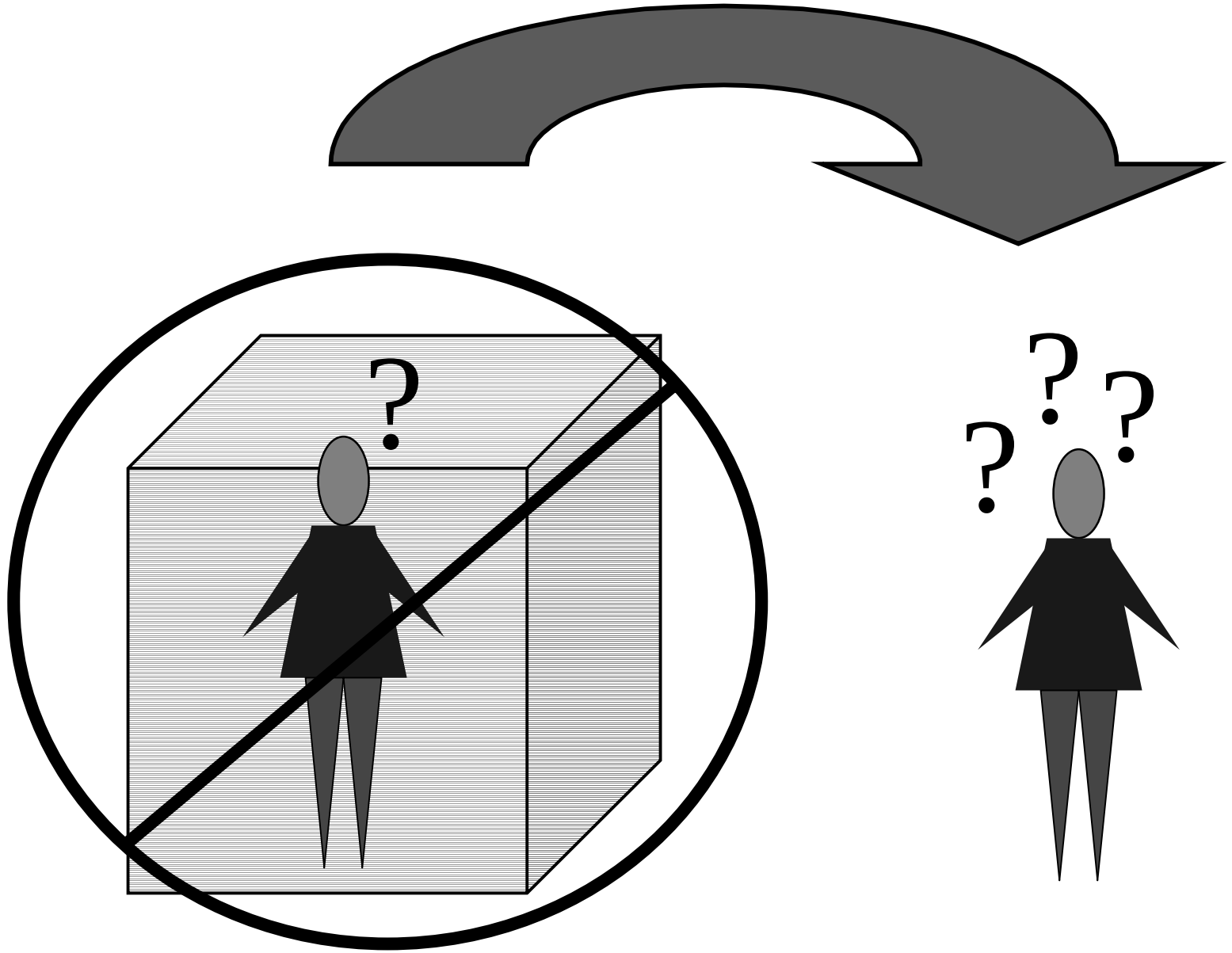

2000

Harris County
Flood Control District

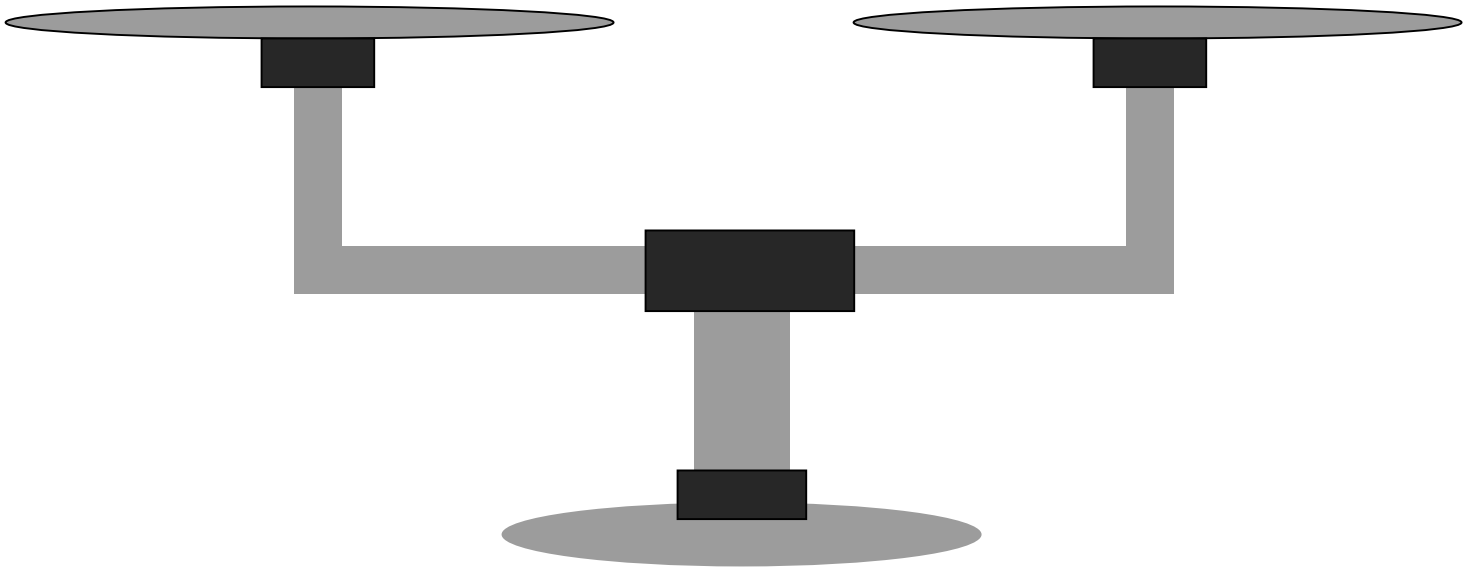

AUTO PARTS


CURRENT
FEDERAL
PROJECT
RANDOLPH PARK
FM 2351
EDGEWOOD RD
N IMPERIAL DR
TASH KENT DR
WANDERING TRAIL
GENEVA

Clear Creek GRR - *where do we go from here?….*



Flood Reduction = Ecosystem Restoration



What is “Ecosystem Restoration”?

“The return of an ecosystem to a close approximation of its condition prior to disturbance.” US Natural Resource Council, 1992

“To repair or replace essential ecosystem structures and functions that have been altered or eliminated by disturbance.” GD Cooke & WR Jordan, 1995

“The process of renewing and maintaining ecosystem health.” Society for Ecological Restoration, 1995

“The process of repairing damage caused by humans to the diversity and dynamics of indigenous ecosystems.”
Texas Society for Ecological Restoration, 2001

“To restore significant ecosystem function, structure, and dynamic processes that have been degraded.”
USACE ER 1165-2-501, 1999

Restoration Targets

Specific Restoration Function

Assisted Restoration

Functionally-focused Restoration

Ecological Restoration

Historic Restoration

Sustainable Development

"Economic growth and activities that do not deplete or degrade the environmental resources upon which present and future economic growth depend."

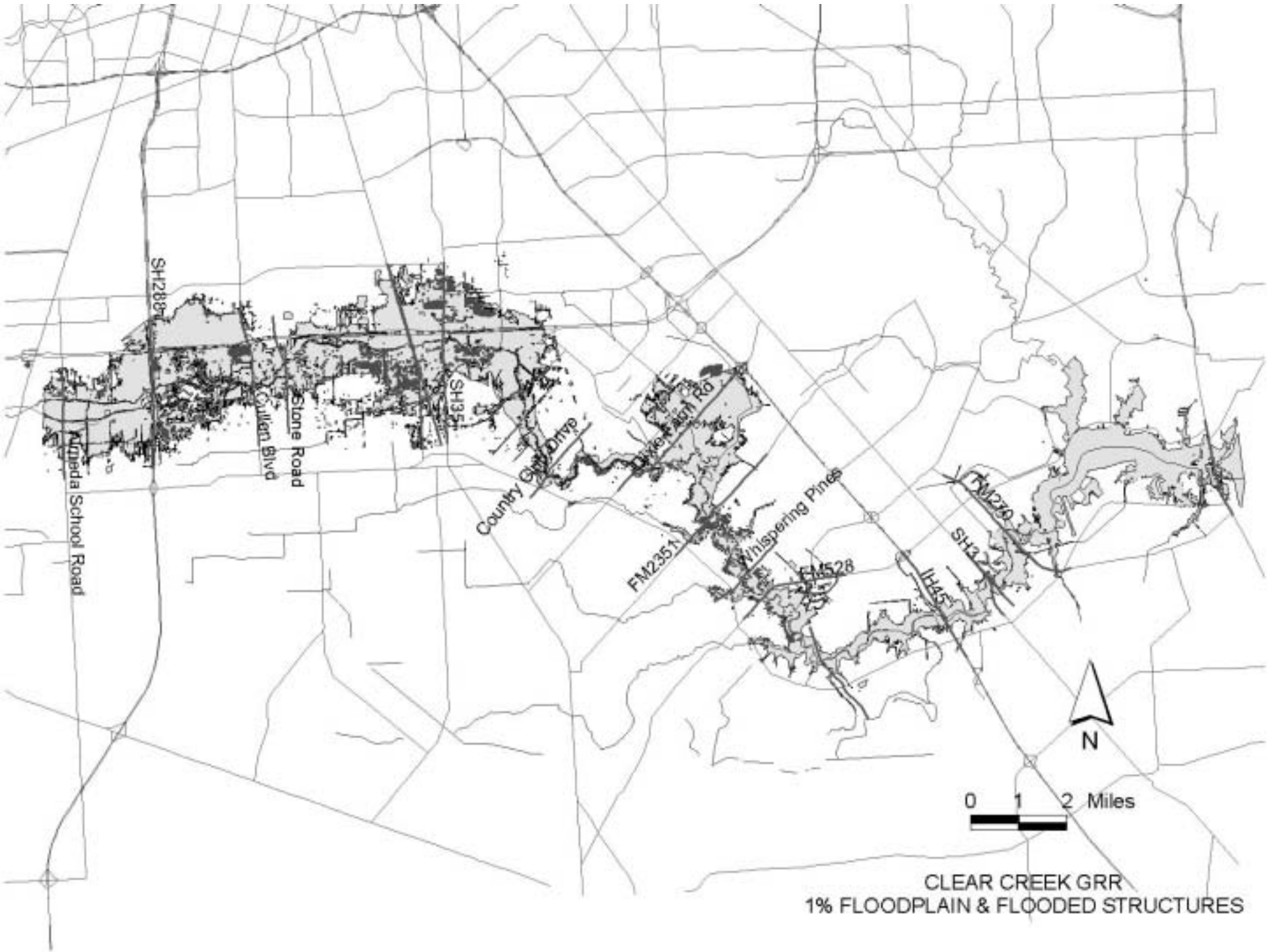
Dictionary of Ecology and Environmental Science

The Journey Toward Sustainable Development

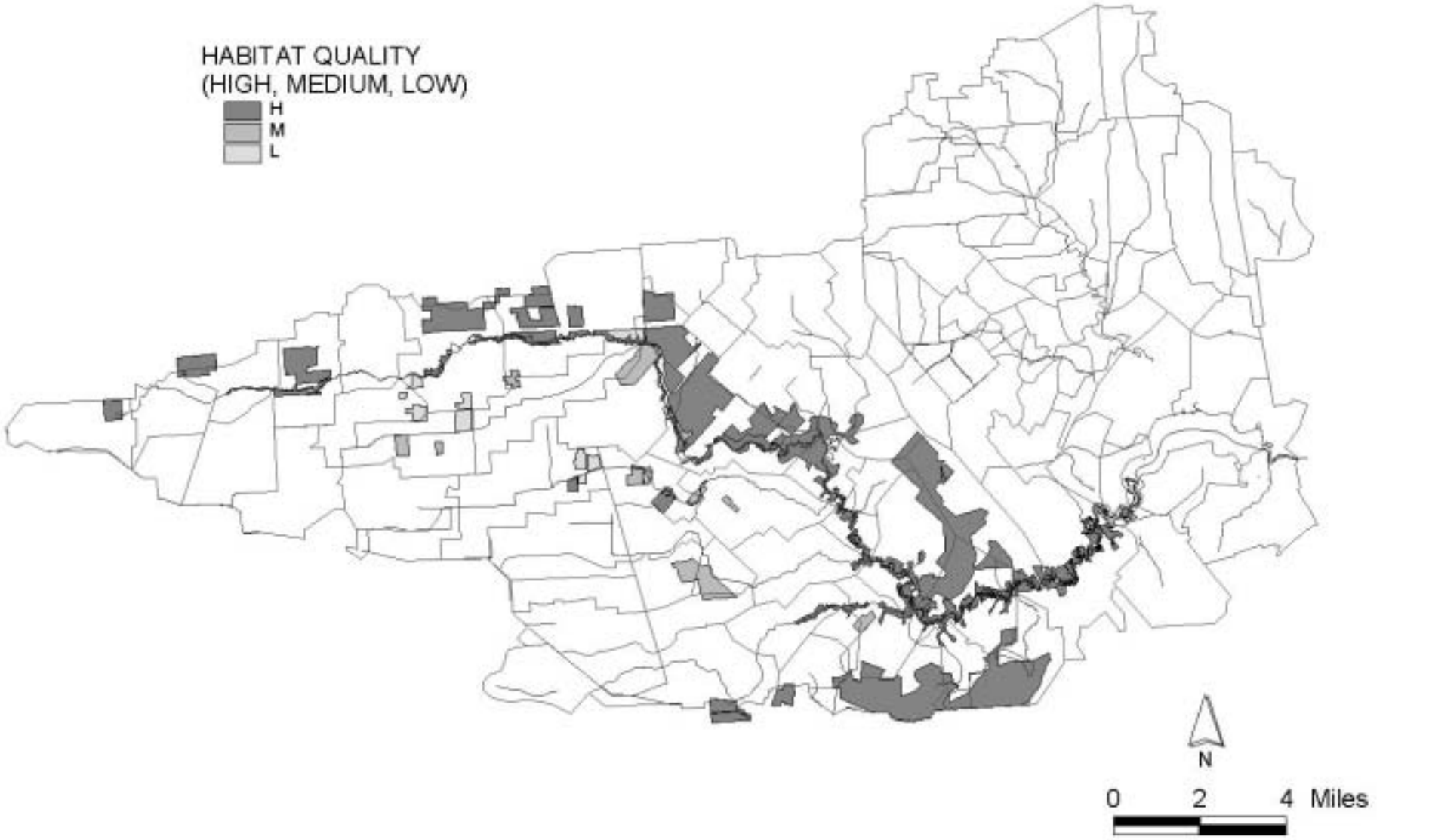
"We're on a common journey shared by many people and organizations in our country, and around the world. It is a journey in which we are transitioning toward Sustainable Development."

LTG Flowers

CLEAR CREEK GRR
HYDRAULIC ROUGHNESS
POLYGON MAP



CLEAR CREEK GRR
1% FLOODPLAIN & FLOODED STRUCTURES



CLEAR CREEK GRR
WATERSHED HABITAT QUALITY


N
W
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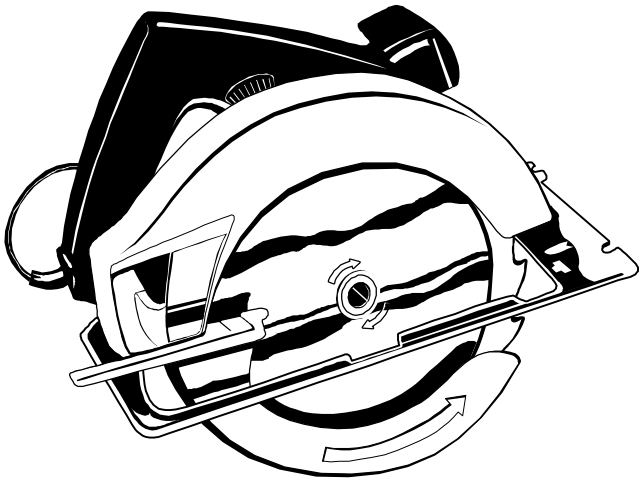
S

Ecosystem Restoration

Flood Damage Reduction

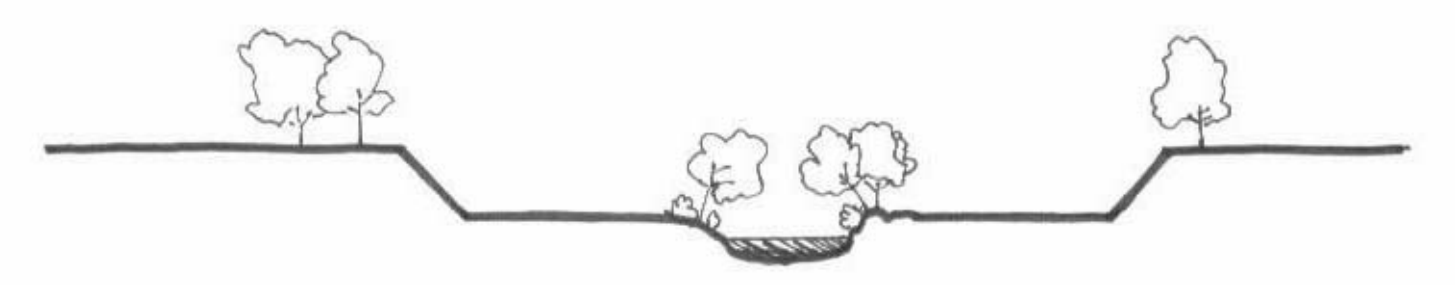
TOOLS?



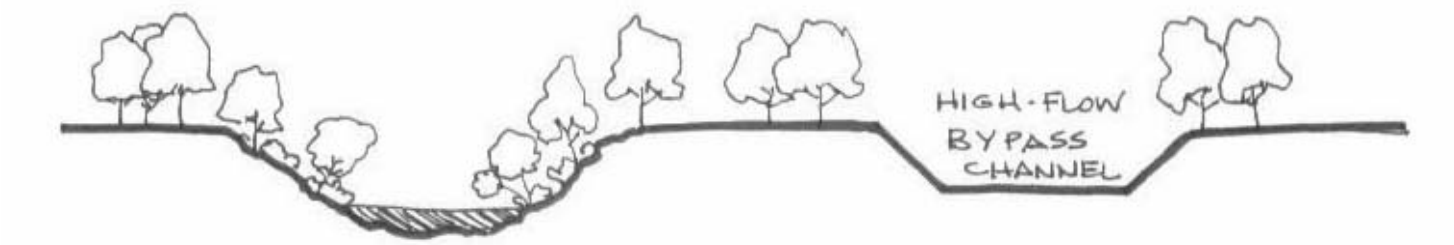
Flood Damage Reduction Measures/Tools

Notebook Includes:

1) Shallow, wide earthen trapezoid
(preserving existing channel)



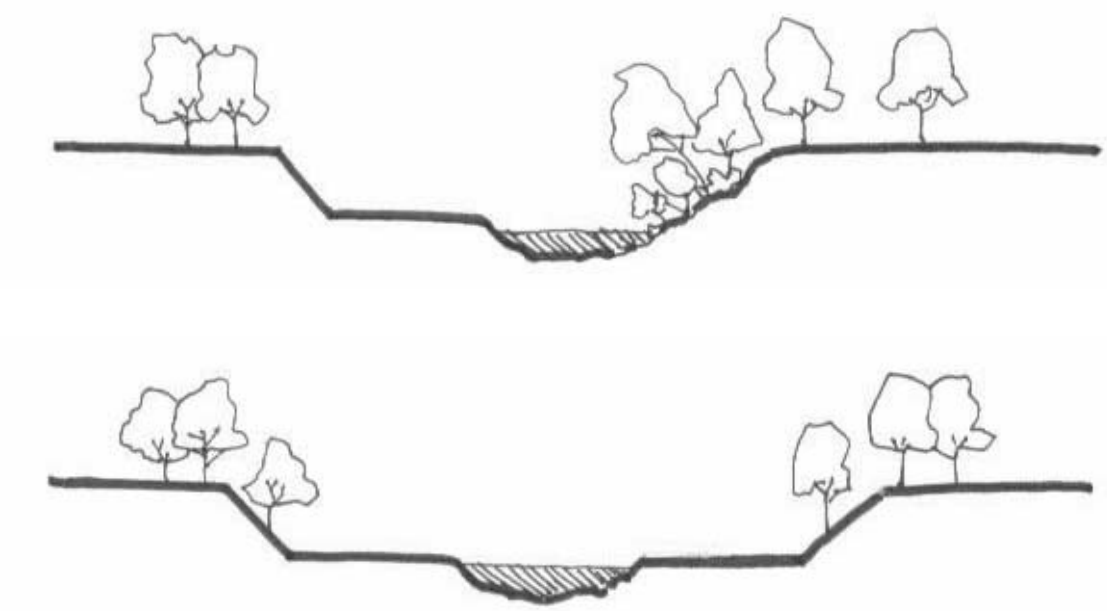
2) High-flow bypass channels
(preserving existing channel entirely)



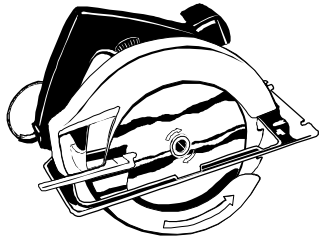
3) Detention basins w/ wet bottoms
(wetland/marsh creation)

4) Bridge raising and widening

5) Excavated, earthen trapezoidal channel w/ park-like greenway features
(1-side only and/or both sides)

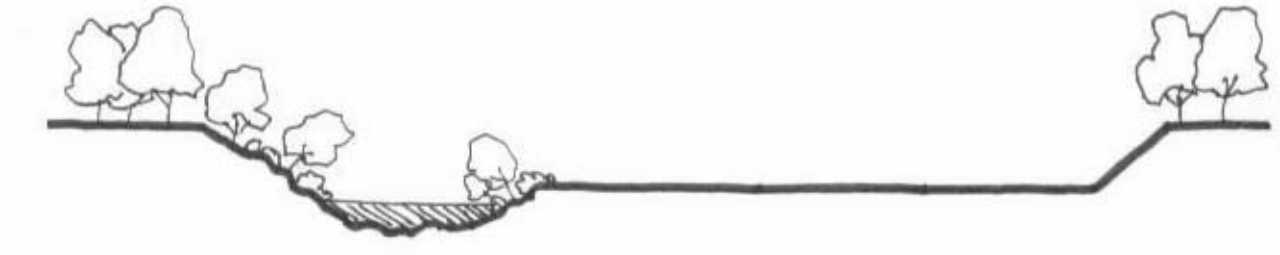


6) Watershed Management Practices

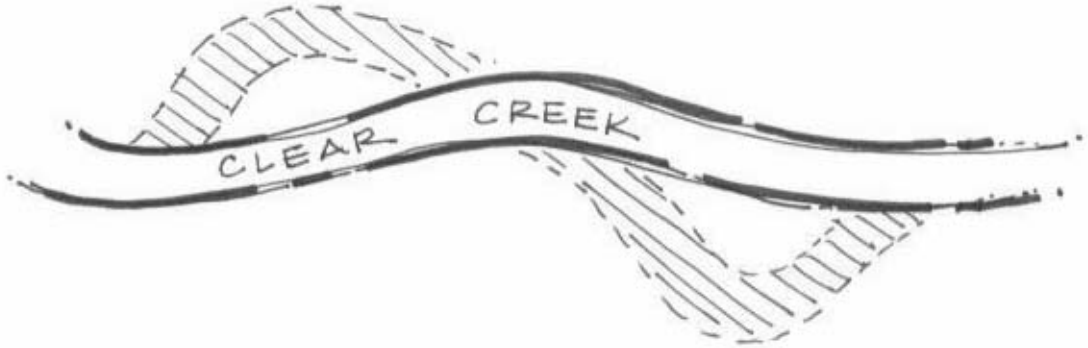


7) Selective clearing of underbrush/small trees (increase conveyance)

8) Inline detention/storage



9) Oxbow meander cut-offs as detention/storage



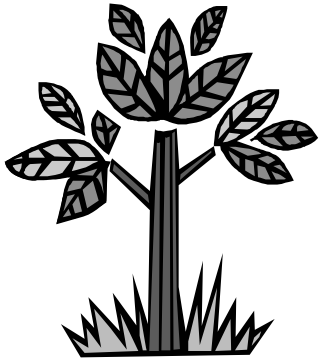
10) Buyouts

Ecosystem Restoration Measures/Tools

<u>Notebook Includes:</u>

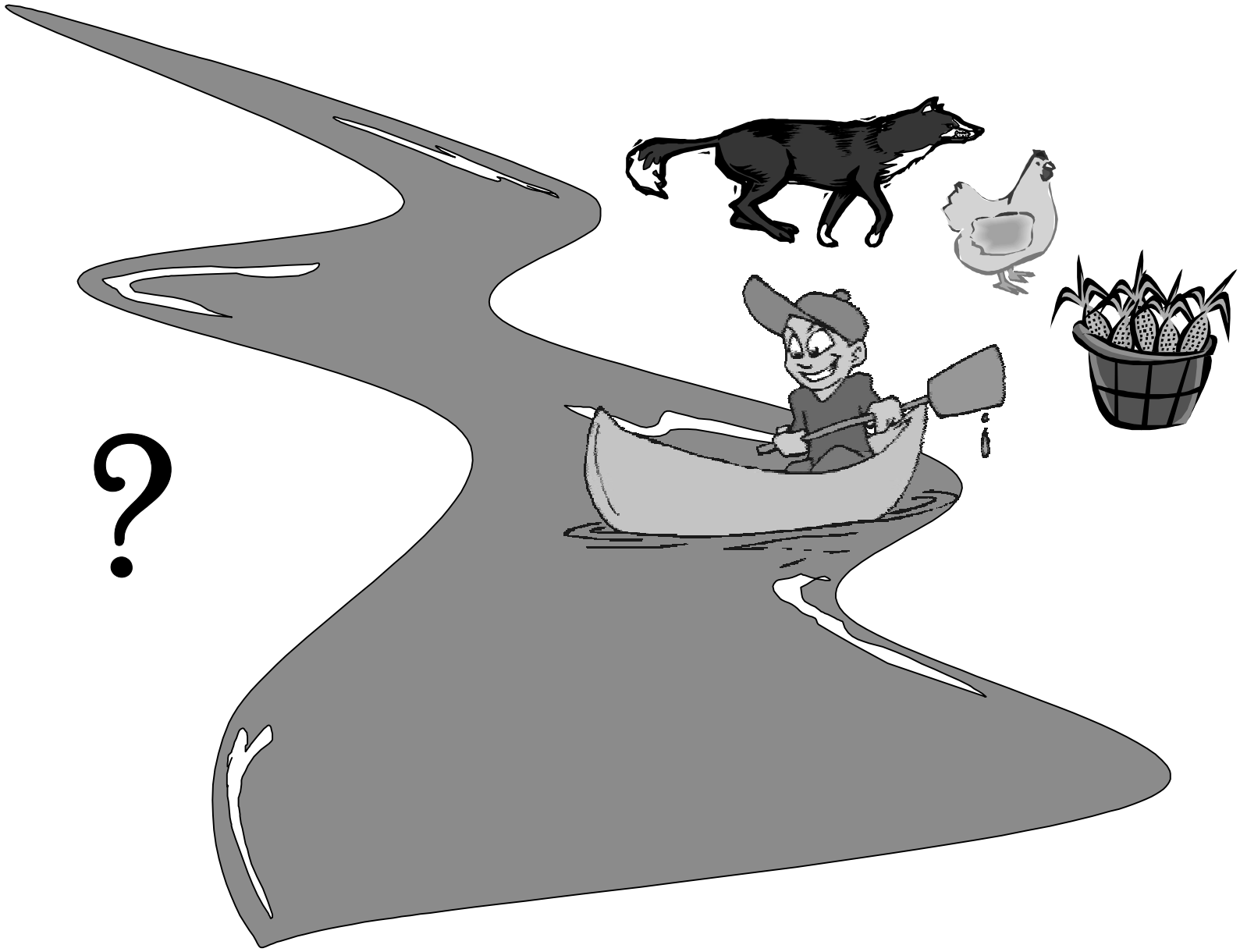
Restoration of….

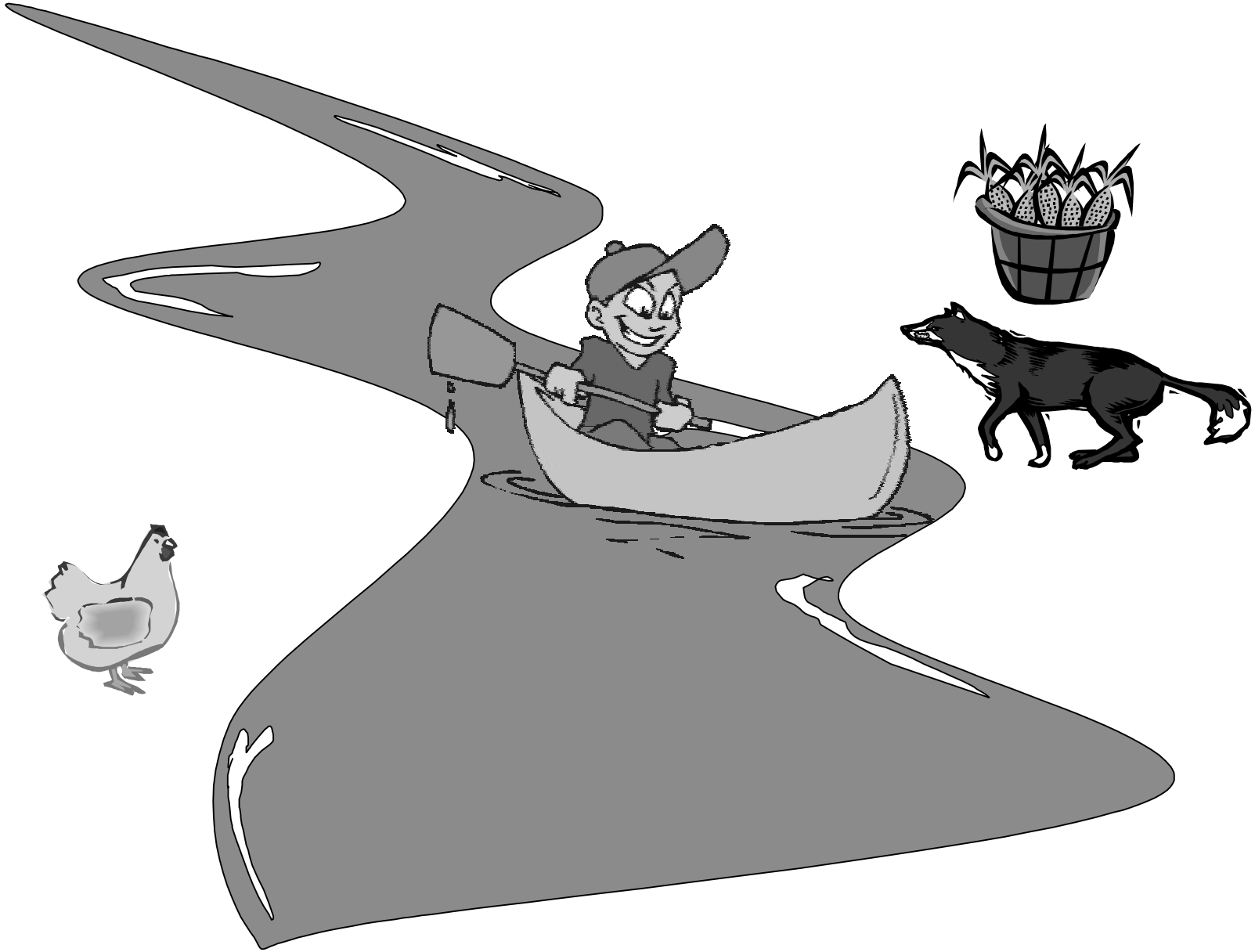
1) Back bay aquatic nursery areas lost to subsidence.
2) Floodplains lost to farming/development.
3) Marshlands lost to sedimentation.
4) Riparian woodlands lost to farming.
5) Prairie pothole freshwater wetlands.
6) Coastal prairie grasslands lost to farming.
7) Tributary hydrology for water quality.

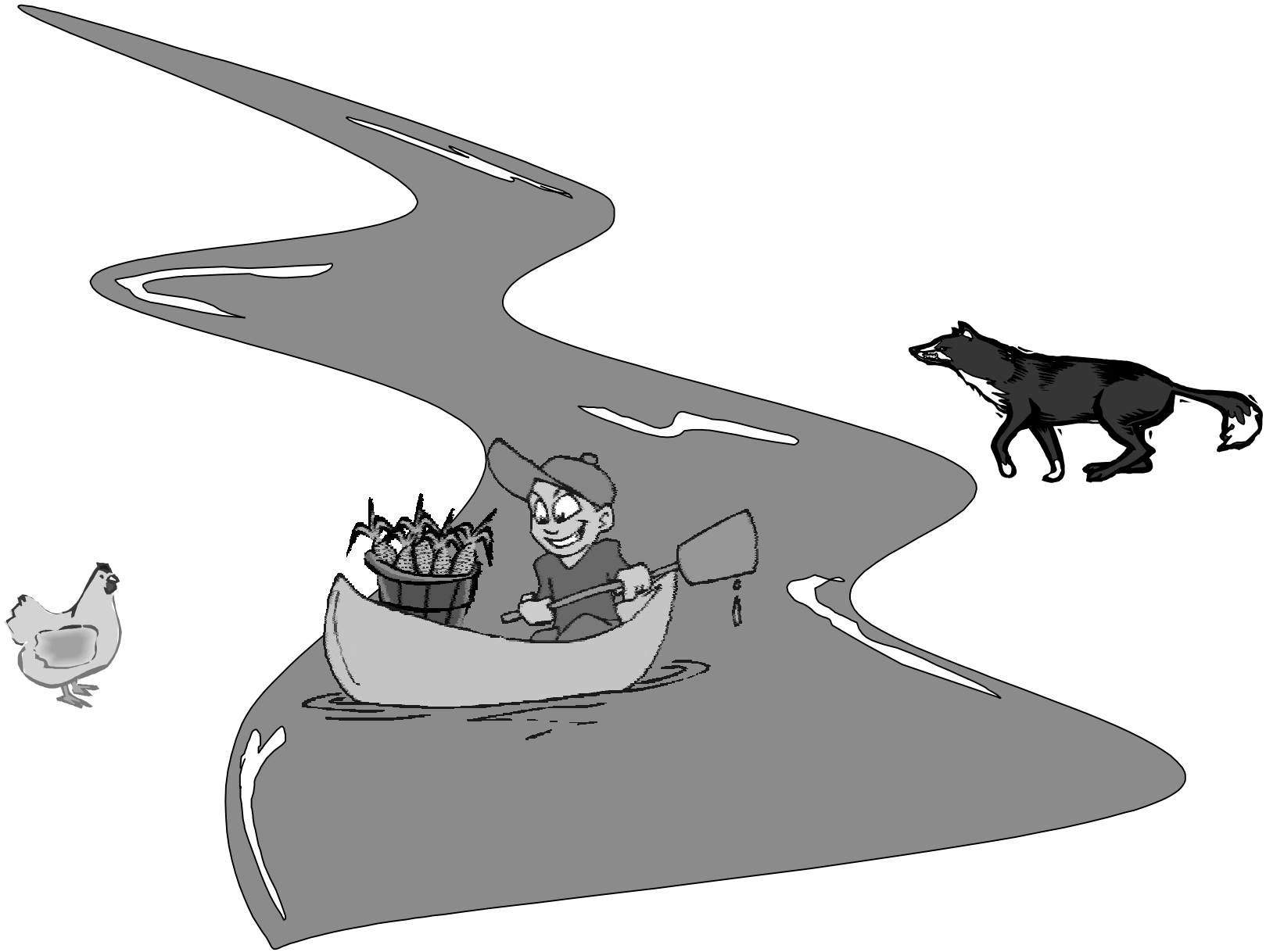


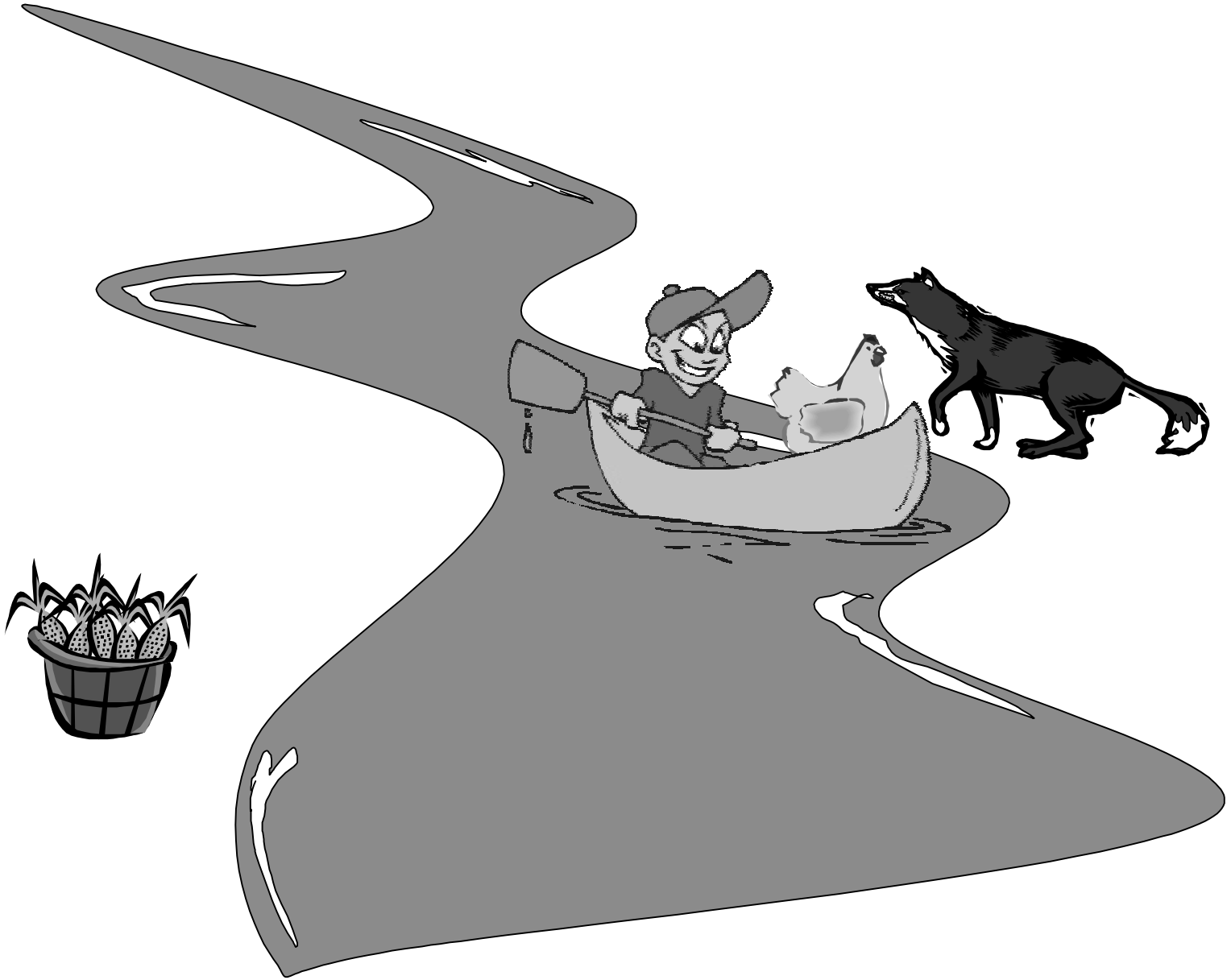
Other tools include:

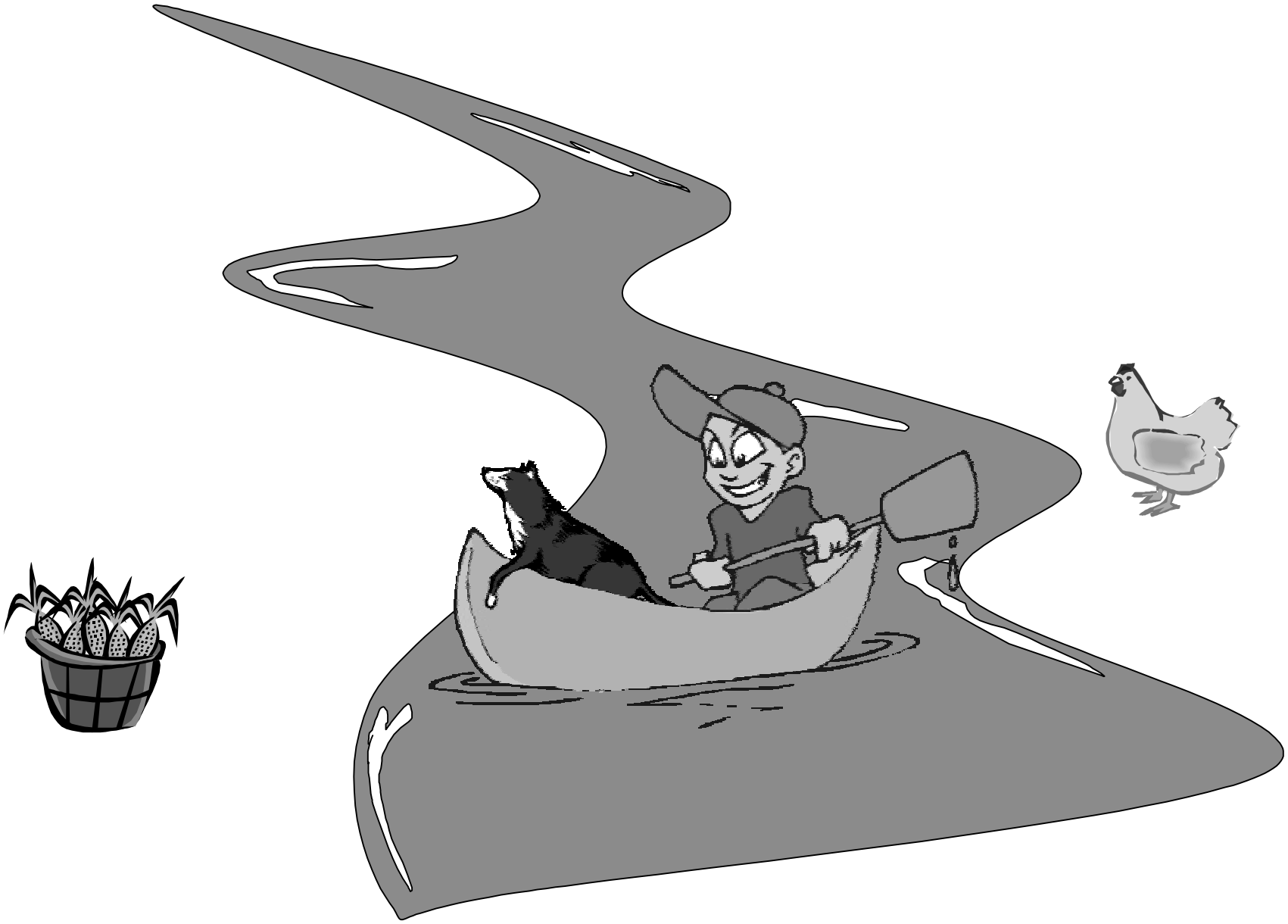
- Trust for Public Land
- Nature Conservancy
- Clear Creek Environmental Foundation
- Texas Parks & Wildlife
- Natural Resource Conservation Service
- Texas Natural Resource Conservation Commission
- US Fish & Wildlife Service
- other NGO's with expertise and funding

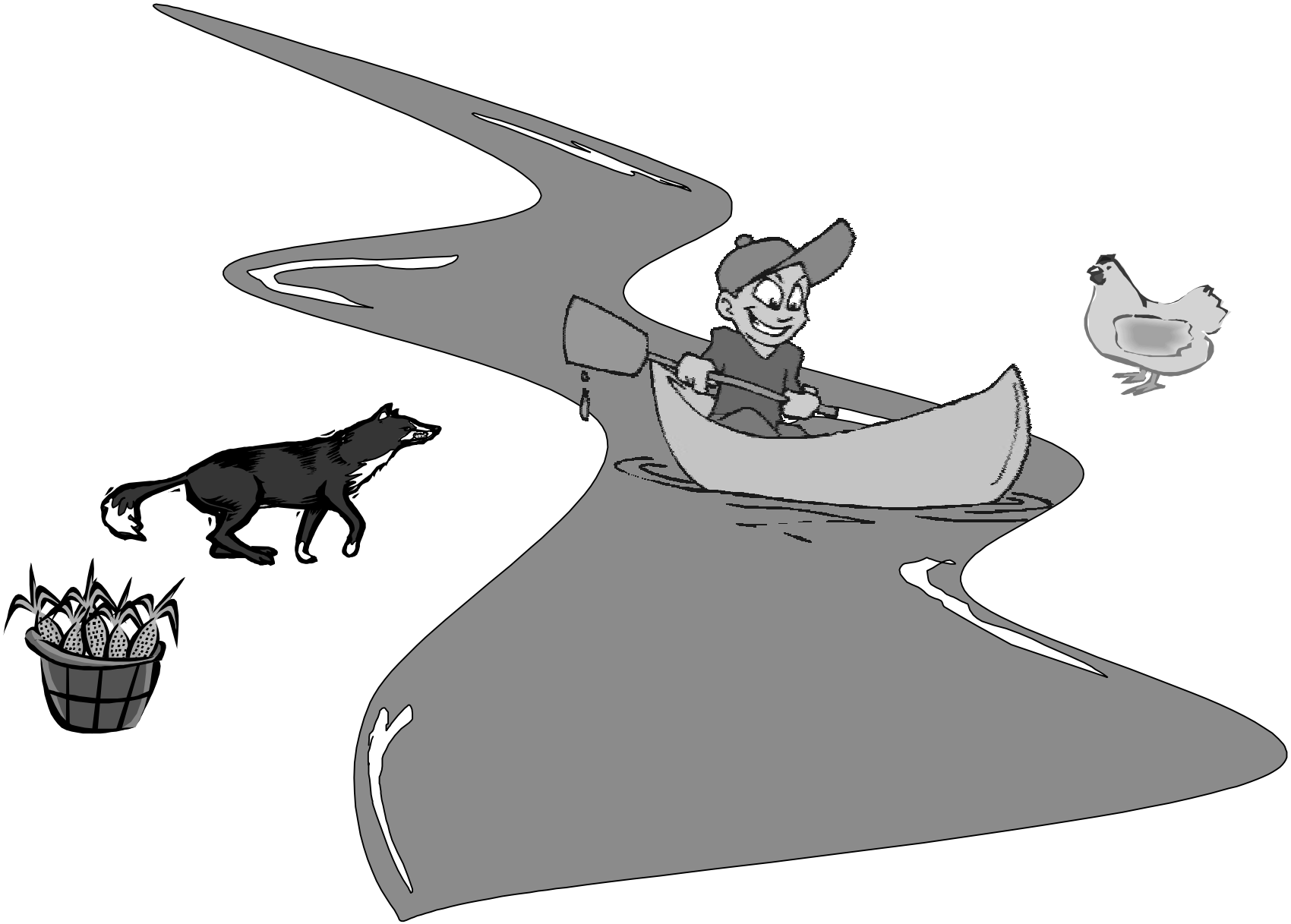


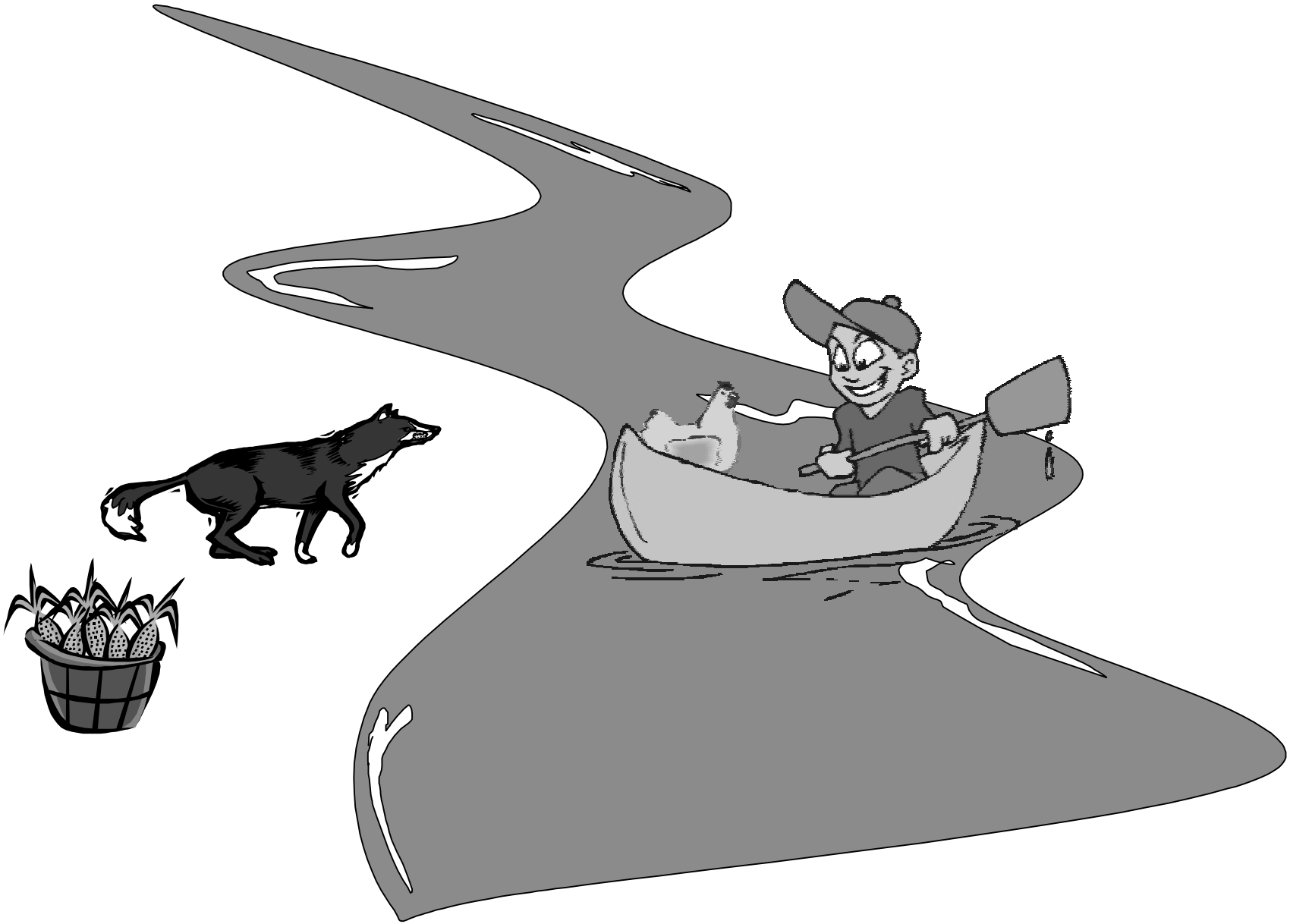


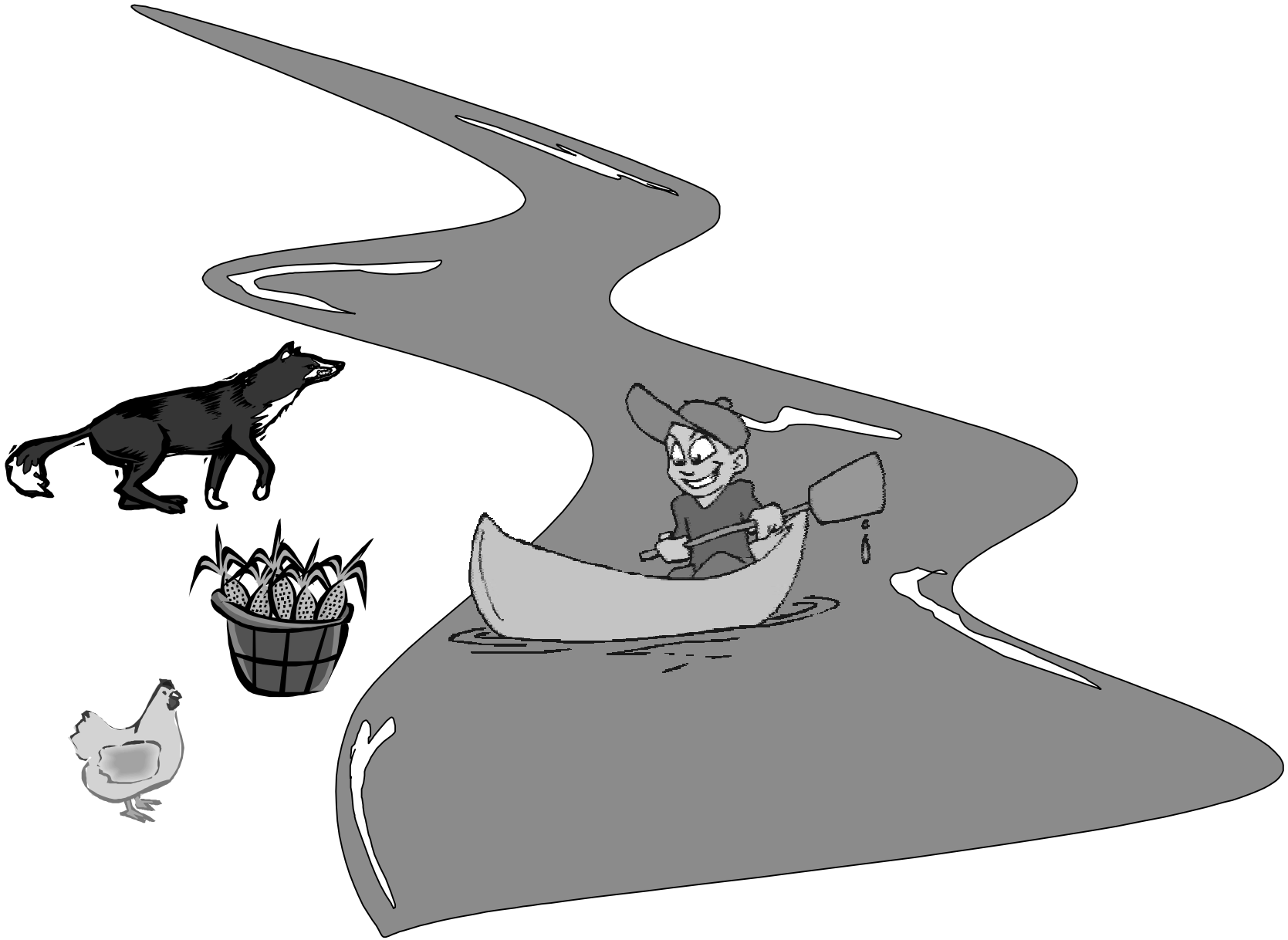


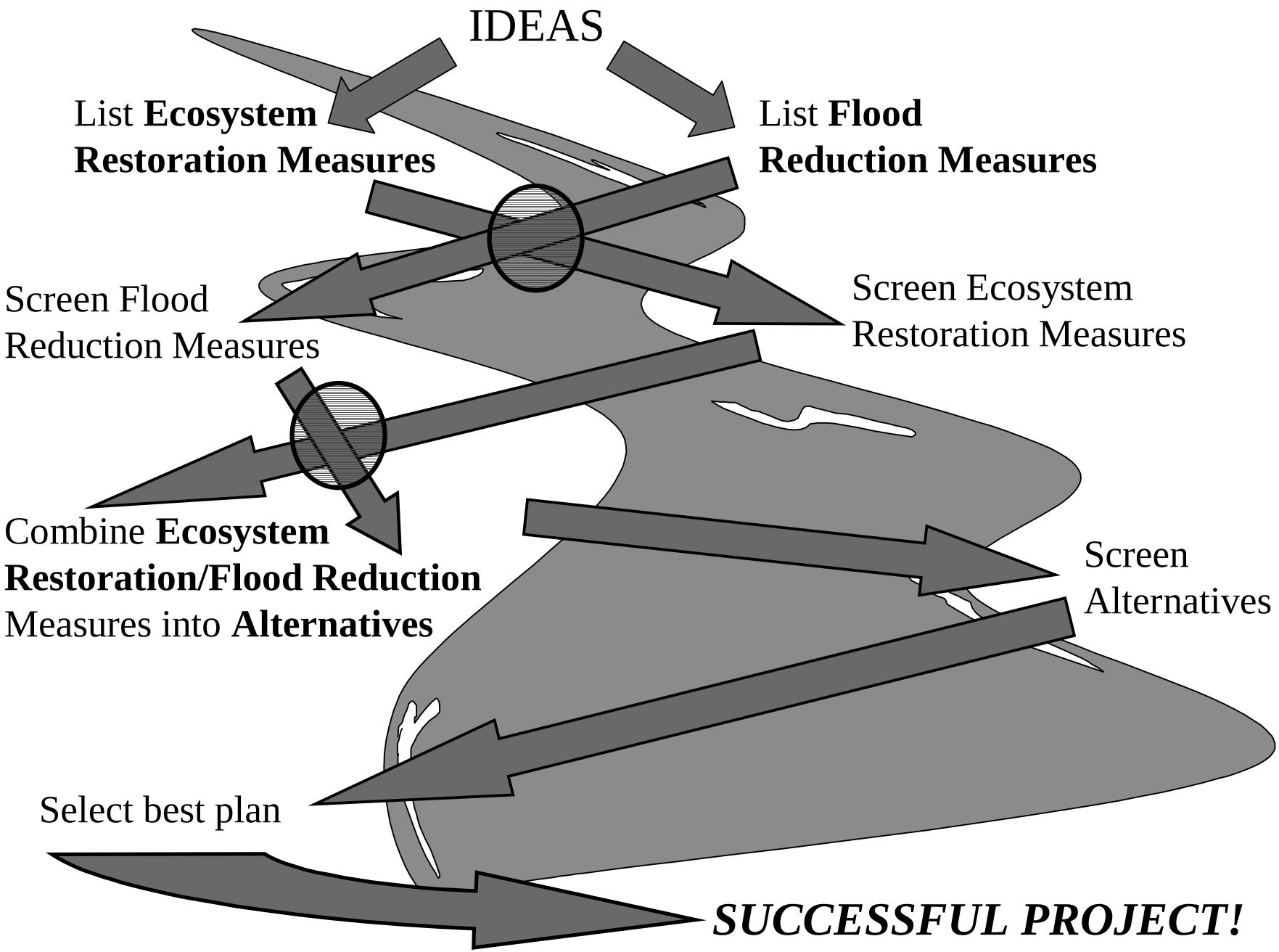











IDEAS
List **Ecosystem Restoration Measures**
List **Flood Reduction Measures**
Screen Flood Reduction Measures
Screen Ecosystem Restoration Measures
Combine **Ecosystem Restoration/Flood Reduction** Measures into **Alternatives**
Screen Alternatives
Select best plan
SUCCESSFUL PROJECT!

Public Involvement

CLEAR CREEK

The Clear Facts O

Summer 2000 Issue 1

Facts on Reducing Flood Dam

Corps to Reconsider Plan

For the past several months, the Galveston District of the U.S. Army Corps of Engineers has been engaged in a complete re-evaluation of flood control solutions for the Clear Creek watershed. Three other agencies representing constituents within the watershed are co-sponsoring the new study. These sponsors include the Harris County Flood Control District, Galveston County, and Brazoria Drainage District Number Four. Brazoria Drainage District Number Four recently requested sponsorship of the study. Their participation expanded the area that can be studied to include reaches of Clear Creek that lie within Brazoria County.

The Corps is not committed to any pre-conceived plan, but is now considering all reasonable alternatives to the original proposal, commonly known as the 1986 plan.

The new study is expected to be completed in 2003.

The new study will completely reconsider options for federally funded flood control plan developed many years ago. The original plan included deepening and widening Clear Creek to relieve serious flooding problems that have affected some areas of the banks for over thirty years.

Numerous alternatives to the original proposal for Clear Creek have been raised by both project sponsors and private citizens. Alternatives under study involve a wide range of ideas. These include channelizing portions of Clear Creek and creating bypass channels and floodwater detention areas. Just as importantly, non-structural options such as buying out frequently flooded homeowners and raising structures are also being considered.

What is a "GRR"...

The acronym GRR stands for General Reevaluation Report. This is the type of study that the Corps of Engineers is currently completing for the Clear Creek Flood Control Project.

A federally-proposed plan to channelize Clear Creek to help reduce flooding was approved in 1986. This original plan is now federally funded. When citizens and local sponsors asked the Corps to consider changes to the original project, the Corps was required to evaluate whether the suggested changes fit within the scope of the existing plan or if they were so significant that a reevaluation of the entire project was warranted.

The Corps reviewed the size and descriptions of suggested changes in 1998. They made the judgment that suggested changes and refinements to the plan constituted major differences in the original proposal. That is when the decision to undertake the GRR in complete re-evaluation was made.

Clear Lake Evaluation

The re-evaluation of flood control alternatives, now being considered by the Corps and the local sponsors, includes a full analysis of potential impacts on Clear Lake.

Clear Lake communities are affected by upstream activities along Clear Creek. In recognition of stakeholder concerns in the Clear Lake area, the Corps conducted a full hydraulic analysis and developed a model evaluating potential flood impacts on a project alternative proposed by the Harris County Flood Control District and Galveston County in 1997. This study, called the "Clear Lake Impact Analysis" was completed in April 1999. The Corps will use the results of this analysis to evaluate additional alternatives and assess any potential downstream impact to Clear Lake residents.

Assessment Concludes Contaminants Will Not Be Released

Residents of the Clear Creek watershed and other interested parties expressed concern about dredging and excavating activities during reviews of pollutants in the Clear Creek. In response, the Galveston District, Corps of Engineers commissioned an assessment of contaminants in Clear Creek. The assessment sampling and analysis was conducted in cooperation with the Harris County Flood Control District, their environmental contractor and a citizens' panel. One important focus of the assessment was the potential for release of contaminants known to exist at the Brio Superfund Site.

The 1998 study concluded that many of the contaminants of concern were not present in samples collected from Clear Creek. Chemicals or pollutants that were present in the samples analyzed were measured at insignificant levels that no adverse impacts are expected from proposed activities. As various alternatives are evaluated as part of the GRR, additional contaminant investigations will be conducted as necessary.

What is GIS????

The latest information and technology is being used in the reevaluation of flood control solutions for Clear Creek. Most of the information is being organized into a "Geographic Information System" or GIS.

GIS is a computer system that can be used to record, store, and analyze information about the features that make up the earth's surface. GIS databases can generate two – or three-dimensional images of an area, showing such natural features as hills and rivers along with man-made features such as roads and power lines. Scientists use GIS databases as models, making precise measurements, gathering data, and testing ideas with the aid of a computer.

GIS databases consist of sets of information called layers. Each layer represents a particular type of geographic data. GIS layers can be created from a variety of sources, including maps, satellite and aerial photographs, and printed text and statistics.

An example of combining layers may include aerial imagery along with population statistics and land use information. Using GIS, scientists can monitor changes in the environment resulting from development, and engineers can model a variety of flood control systems.

As part of its research on Clear Creek, the Corps is extensively using GIS with newly obtained aerial imagery, updated population and land use information, and new topographic survey data.

(continued from front)

subdivisions, stores, and other commercial sites means that this same space is not available for flood control features. For example, a detention basin requires excavation of a large tract of undeveloped land. If there is no space left for the basin, another flood control solution must be found.

The current reevaluation of flood control solutions for Clear Creek, the GRR, is using the latest available information on land use and population growth. Planning for flood control solutions will be based on this information. The study is scheduled to be completed in 2003, with project implementation to follow as soon as possible. Delays in implementing the project may result in the loss of flood control options as development in the watershed continues, because eco-friendly solutions are generally land-intensive. This is the main reason why finding a viable project that is generally acceptable to the public and the local sponsors as well as the U. S. Army Corps of Engineers is a primary goal of the study.

You Can Help Us!

Consultants to the Corps are performing an ecological inventory of habitats along the creek. If you know of special habitats, we'd like to know what and where they are. Examples would be places you would go to bird-watch, look at wildflowers and other interesting plants, and generally enjoy the natural beauty of the creek.

Visit our web site at **www.clearcreekproject.com** to log your comment or submit it at the public meeting on March 15. We will have copies of maps available at the meeting so that you can mark these special locations.

Acronyms and Definitio

GRR–General Reevaluation Repo

This is the type study that the Co of Engineers a local sponsors current completing for t Clear Creek Flo Control Project.

GIS–Geograph Information System: is a computer syst that can be us to record, store, a analyze information ab the features that make the earths surface.

Detention Bas

Detention basins are m made depressions that coll stormwater and temporar store it so that it flo downstream at a slower ra This reduces the peak flow d stream during a storm event a helps reduce flooding.

High-Flow By-Pass Channel:

high-flow by-pass channel creat a secondary path for stream flow travel more rapidly between ban in the creek during storm even During dry weather, by-pass locatio can serve as recreational area

Can't Make the Public Meeting?

Mail your comments to:
Donald R. Allen
U.S. Army Corps of Engineers
P.O. Box 1229
Galveston, TX 77553-1229

WHO IS ON THE PROJECT TEAM?

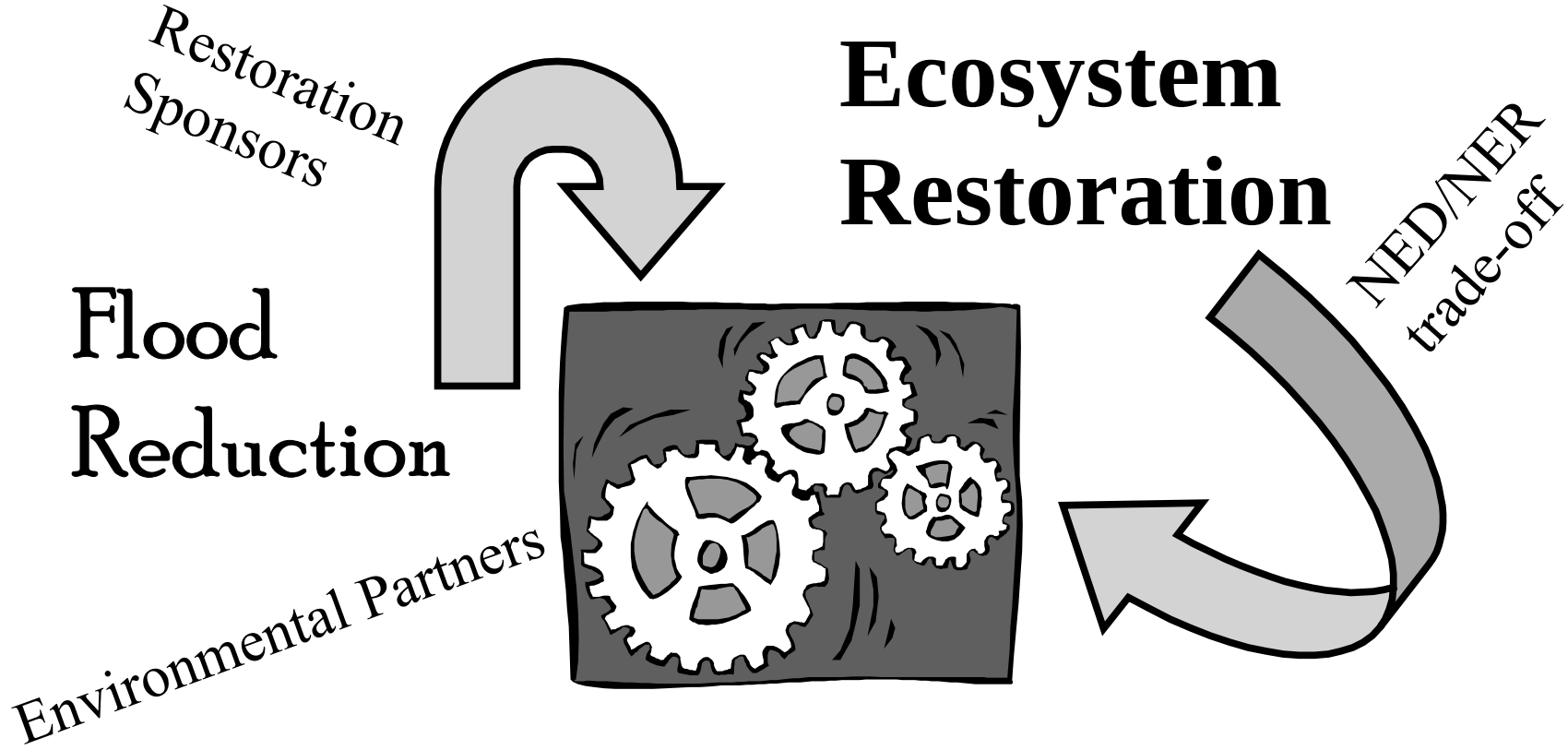
Permission Slip

JUST DO IT!

LTG Flowers

1. Good for customer?
2. Legal and ethical?
3. Something I am willing to be accountable for?

Clear Creek Project



= *Environmentally Sustainable Project*